



Arguments for use of ABC in TQM environment

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In the current context, analysis methods of management, quality-centered management is of particular relevance. TQM is a management approach with great potential, which incite to new and deeper analysis and research. Multiple analyses of the techniques, methods and TQM require expansion and accounting solutions. The application presented is a model for tracking quality costs in terms of applying TQM. Tracking quality costs using ABC is the solution obtained after a thorough analysis of TQM and ABC method. For relevance solution, we chose the solution in an enterprise application. The material presented is a step in the successful implementation of TQM using the method of analysis of quality costs ABC method.

Keywords: quality costs, quality management

JEL codes: D24, M11, M41, O12

1 Introduction

Total quality management (TQM) is an approach that seeks to integrate all organizational teams by focusing on customer satisfaction and the organizational objectives achieved by implementing quality, productivity and competitiveness (Pfau, 1989). TQM philosophy emphasizes the role of internal and external customers, suppliers and employees involved in pursuing continuous quality improvement (Oakland, 2002; Kanji, 2002; Claver, 2003; Karia and Asaari, 2006; Chang, 2006).

Despite criticism, TQM has gained recognition as acceptable academic and business environment. (Longenecker, 1994; Claver, 2003; Chang, 2006).

Research has shown that TQM can be considered a set of methods and management techniques focused on promoting higher levels of the client. Higher values of the client are identified and express latent customer needs, leading to changes in market values and improve the processes of making products and services.

TQM implementation and organizational causes significant changes are argued the need to revise and update the organization's performance measurement system for conducting the implementation of TQM. TQM is defined as an integrated management system, developed in order to focus its resources to increase the quality of the firms production or services, customer satisfaction and improve the efficiency of processes taking place in manufacturing and service firms.

TQM principles are effective in training a range of capabilities which increase quality. The efficacy of TQM practices is consistent with the formation of innovative capacity to organize resources (Perdomo-Ortiz, 2006; Prajoro and Sohal, 2006; Santos-Vijande and A'lvarea-Gonza'lez, 2007).

There is a positive relationship between TQM implementation and performance practices and adoption of TQM is delivering positive results. TQM practices have a significant impact both on product quality and product innovation. Creating new products but also to improve the quality of existing products as part of the effort of production companies. The TQM practices are strong in product innovation than product quality, in line with the main functions of production.

1.1 Firm performance when used TQM

Advocates of TQM implementation suggests that there should be a positive relationship between implementation of TQM practices and financial performance measures of the company. Studies in this regard support the idea. However, companies have better financial performance are more willing to adopt TQM, because they are already on the road to financial success improve.

Have been carrying out numerous studies that explore the relationship between TQM and financial performance. A conclusion of this analysis is the relationship between TQM implementation and financial performance methods, about which are based on costs associated with low quality (security and additional processing). In essence, greater than the increased costs, improve quality and reduce costs. Therefore improving the quality has a positive effect on financial performance measurement.

Raising the quality of products or services may increase the retention rate of existing and attracting new customers, thus improving market share and the company revenue. High quality products and services could lead to increased customer loyalty, higher prices, reduced subsequent service calls and increase productivity. The literature is considered a period of 5 years would be acceptable period of analysis of the impact the financial performance of TQM practice firms.

In conclusion, we can consider that the methods adopted TQM improves financial performance of firms that adopted TQM.

1.2 Terms of TQM implementation

The companies have better financial performance are more willing to adopt TQM, because they are already on the road to financial success improve.

Several studies, including the study by Kenneth M. York, Cynthia E. Miree, explore the relationship between TQM and financial performance.

If TQM is implemented following conditions must be met:

- is important for managers to understand the general principles of TQM;
- managers should not blindly apply the basic tools and techniques of quality management in production;

- managers must develop their own version of TQM practices in general TQM principles;
- TQM must be implemented fully and taking into account the important results obtained previously, requirements necessary to successfully implement TQM;
- during the implementation of TQM should be considered long term and sustained involvement of top management, leadership involvement, support of cultural and updating systems of thought. Systems thinking are crucial here because the production companies, design process must take into account the context of business requiring functional integration combined.
- TQM practices should be implemented in an integrated manner.

1.3 General framework for implementation of TQM

Although they have been written about TQM, has paid little attention to the potential effects of contextual factors on TQM and the relationship between TQM and organizational performance. Literature on TQM indicates that the TQM concept can be measured by seven broad categories of practices include: leadership, strategic planning, customer focus, information and analysis, human resource management HRM, process management and supplier management.

Pioneers quality Deming, Crosby and Juran suggests that quality management principles are universally applicable, but recent research conducted by Dean (1994) and Sitkin (1994) suggests that the principles of TQM, may in fact be dependent on the context, which can lead to reliable interpretation of TQM practices and tools inadequate.

Dependent-contextual approach in administrative innovation was also discussed organizational theory literature. Administrative innovations on each change of organizational structure and administrative processes and are related primarily to management organization and are less related to basic work activities.

2 Types of quality costs outlined in Accounting

Quality cost control when applying TQM is a major challenge in contemporary business conditions. Continuous quality improvement is an overarching concept for many companies despite recent adverse terms of trade. Quality is a strategic imperative for many successful organizations. To a large extent, the quality is recognized to be key area of competitiveness in the global market, quality is now the most used resource that companies differentiates their products and services in order to maintain or improve their market share.

Quality is a "total concept" involving each and every of the organization so pervasive use of the term TQM - Total Quality Management-is an expression of ideal quality. Strong demand TQM program in the initial deployment phase is to quantify the cost of quality. These costs include the quality management system to take on the design phase, implementation, operation and maintenance of the organization, cost of resources involved in continuous quality improvement system plus the cost of product failure.

When the overall cost of quality is minimal, the contribution of quality to profit is maximized. Excessive costs of quality, on the other hand, are synonymous with the existence of lost profits unnecessarily. The uses are many and varied quality costs. In particular, they provide a powerful management tool for evaluating overall effectiveness of quality programs. Dale and Plunkett stress the importance of quality costs and improve business performance measurement. Groocock stresses the importance of setting targets for quality and cost reduction measures to be planned to achieve those targets. However, the behavior of quality costs is not always easy to understand.

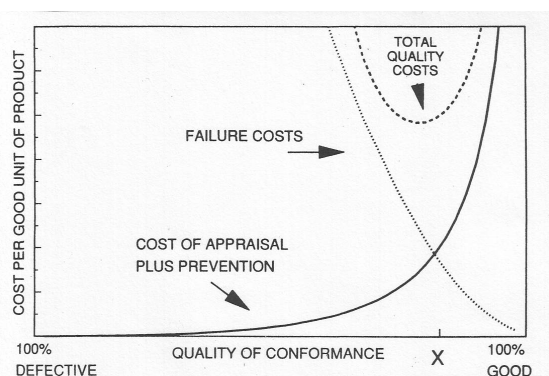
Quality costs can be classified in various ways. Besterfield makes distinction between the direct and indirect costs, and later identifies the costs, although initially are born to the client, have an impact later in the organization. Indetermination due to the nature of most indirect costs, efforts were concentrated on estimating the direct costs of quality.

Despite widespread adoption, PAF (prevention, appraisal, failure) - the model known as model COQ (cost of quality), a great deal of criticism. The COQ agreed, is now highly disputed and the model itself was attacked because it has no empirical evidence to support the scientific product. Exponents of philosophy "zero defects" that challenges the picture quality costs tend to approach infinity if the compliance is approaching 100%. The joint enforcement levels, there are significant problems of implementation of the model, difficulties in estimating the costs of prevention and external failure costs.

The "cost process - PC" model developed to help more or less in overcoming weaknesses PAF, has the disadvantage of not being tested. PC model costs are the costs of compliance and non-compliance, costs are identified separately in the elements of the people, equipment, materials and environment. Differently by PAF, PC involves many efforts in the classification of costs and allows users to focus the real purpose of analysis, i.e. to reduce quality costs.

An interesting alternative to PAF and PC model is a model of Taguchi. Taguchi proposes a function of the amount lost, the overall loss (consists of tangible and intangible losses to the customer).

Figure 1.
Quality costs according to % rate of defects



3 Using ABC to implement TQM

3.1 The advantages of using ABC

Method Activity-Based Costing (ABC) originally appeared in the United States of America in the late '80s as a result of work by the group CAMI. Traditional cost calculation models used for allocating indirect costs based on a uniform allocation, on a rough average in terms of resource consumption of a product (or the subject of cost), while actually, the consumption of resources is done in a uniform manner.

Traditional methods lead to the emergence of such phenomena underestimate, overestimate or subsidy costs. To avoid these errors, companies looking to refine their cost system. With this refinement should ensure a better appreciation of the uneven consumption of resources. ABC method is one way of refining the system cost.

Basics of implementing ABC method are:

- Cost objects consume activities;
- Activities consume resources;
- Consumption of resources is generating costs;
- Understanding the causal relationship is the basis of successful management.

Context of the emergence and the need for ABC method can be explained by the following elements:

- Increased indirect costs in most sectors of the economy, both as absolute value and relative value;
- Change the nature of indirect costs. Share of indirect costs in total costs increased at the expense of variable costs related to production volume, this being due to the complexity, diversity of product mix and product quality;
- Development of direct labor. The proportion of direct labor costs in the total cost has been reduced steadily.

ABC method is motivated by the belief that traditional accounting information is useful to managers, who are interested in assessing the effectiveness of resource allocation decisions in their businesses. CAMI defined as the ABC method that method used to identify connections between cost drivers causes of cost and cost of activities by measuring process costs covered activities and cost objects. From one of these definitions are derived and why it is necessary to ABC method. Therefore, early ABC method is more accurate than traditional methods beginning.

ABC method in the TQM implementation is done in accordance with certain requirements and involves:

- Establishing processes, activities and operations according to specific cross-organization of the enterprise;
- the establishment of units or cost drivers related articles cost calculation specific TQM;

- the adoption and improvement of the specific documents that ABC method. Therein will include registration of documents aimed at production, the cost of deviations from cost ante calculate respectively piloting indicators analysis and scoreboards.

Shank and Govindarajan (1993) argue that cause and effect of quality of work is some of the cost of primary cost drivers of an organization. Implementing a quality improvement, in this case TQM, ABC makes the whole system can provide information about activities that do not provide measurable value and the cost drivers. Cooper in 1992, shows that companies have consolidated their activities in a 9-point scale, where 1 represents no value-added activities (correcting errors) and 9 are activities with high value customers. Using this scale, companies establish improvements, focusing on eliminating activities with low or medium value. By simplifying concepts ABC method, one can identify activities are identified as worthless and quality improvements, without time and without additional costs required to implement all of the ABC method.

Simplified analysis of the activities aim is to identify activities and costs associated with the prevention, appraisal and correction of quality.

3.2 Stages of implementation of ABC method

In the method ABC must account appears the following stage (treatment of direct costs is the same as the traditional cost calculation):

1. Identifying activities and costs. Number of activities depends on the fineness of the expected information system;
2. Setting cost driver cost for each activity (cost driver);
3. formation of homogeneous cost pools, by grouping activities with the same (determined as the causal structure of costs);
4. calculate cost of parts, subassemblies, by adding direct costs to the cost of necessary cost drivers;
5. calculate cost of products, works, services;
6. calculate total cost.

4 TQM implementation model using ABC

To implement TQM must meet the following conditions:

- Company should benefit from TQM gradually, increasing continuously product quality, customer satisfaction and market share (TQM implementation should be applied at least 5 years);
- Management accounting organizes the specific application of ABC method;
- Responsibilities for quality data collection costs are made by the Department of Quality Assurance but with sales and supply department and the production department;
- should be used "method of analysis of processes" to determine key quality activities, are identified to work on quality and cost are identified cost drivers;

- being drawn up "The cost of quality" during the years of study;
- Management company should focus on cost control nonconformities, internal failure costs and external failure costs;
- To examine "The cost of quality" at the end of each year to determine whether the cost of internal failure had a greater or less than the cost of external failures and to be able to act (i.e.: external failure had a percentage higher than external failure);
- Pareto chart is drawn up and cause-effect diagram to analyze the costs of failure in internal / external (if internal damage is higher than external failure).

4.1 Identification of activities on quality and cost to identify cost drivers

In the process of improving the quality of specific activities have been identified qualities activities have been grouped according to TQM. After identifying the activities have been established cost drivers. In summary, the link activity-cost drivers are shown in the Table 1:

Table 1.
Activities TQM - cost drivers:

Activity	Cost driver
1. Activities related to prevention	
1.1 A. Preparation of quality management	1.1.A. number of persons employed in the unit
1.2 B. Audit suppliers	1.2.B. unit labor hours
1.3 C. Inspection of new products	1.3.C. unit labor hours
2. Activities related to appraisal	
2.1 A. Inspection of new materials	2.1.A. unit labor hours
2.2 B. Inspection of incoming materials	2.2.B. unit labor hours
2.3 C. Inspection of current activities	2.3.C. unit labor hours
2.4 D. Final inspection of products	2.4.D. unit labor hours
2.5 E. Chemical Inspection	2.5.E. unit labor hours
2.6 F. Testing instruments work	2.6.F. unit labor hours
2.7 G. Correction tools work	2.7.G. unit labor hours
2.8 H. Final verification tools work	2.8.H. unit labor hours
2.9 I. Maintenance work tools	2.9.I. unit labor hours
3. Activities related to internal failure	
3.1 A. Identification of defective products	3.1.A. unit labor hours
3.2 B. Repair of defective products	3.2.B. unit labor hours
3.3 C. Losses due to interrupted work	3.2.C unit labor hours
4. Activities related to external failure	
4.1 A. Customer Complaints	4.1.A. unit labor hours
4.2 B. Sales returns and reduce sales	4.2.B. unit labor hours
4.3 C. Additional customer service costs	4.3.C. unit labor hours

4.2 Composition "quality cost report"

In Table 2 are shown the details for "Quality cost report" during the years of study. Company management should focus on cost control nonconformities, internal failure costs and external failure costs; Analyze "Quality cost report " at the end of each year

to determine whether the cost of internal failure had a greater or less than the cost of external failures and to be able to act in the future.

Table 2.
Quality Cost Report

CATEGORIES	ACTIVITIES	year 1		year2		year 3	
		AMOUNT	% SALES	AMOUNT	% SALES	AMOUNT	% SALES
1. COSTS OF PREVENTION	A. PREPARATION OF QUALITY MANAGEMENT	101150		150550		221750	
production preparation	B. SUPPLIER AUDIT	14600		24300		20100	
(Internship)	C. INSPECTION OF NEW PRODUCTS	7200		9000		11000	
	D. SUBTOTAL	122950	0.66%	183850	0.66%	252850	0.45%
2. APPRAISAL COST	A. INSPECTION OF NEW MATERIALS	6400		9460		10800	
	B. MATERIALS INSPECTION ARRIVED	1560		2535		5530	
PRODUCTION (Internship)	C. CURRENT INSPECTION ACTIVITIES	13500		24450		50850	
	D. FINAL INSPECTION OF PRODUCTS	11250		27900		72100	
	E. CHEMICAL INSPECTION	90000		113000		319000	
	F. TESTING TOOLS WORK	1110		2190		2560	
	G. CORRECTION OF WORK TOOLS	5500		9450		10900	
	H. FINAL VERIFICATION TOOLS WORK	1120		20025		16050	
	I. MAINTENANCE WORK TOOLS	18000		25900		29150	
	SUBTOTAL	148440	0.80%	234910	0.84%	516940	0.91%
3. INTERNAL FAILURE COST	A. DETERMINATION OF DEFECTS	24000		30200		49100	
	B. REPAIR	3600		4550		675	
PRODUCTION (Internship)	C. LOSS due INTERRUPTED WORK	4300		4005		5050	
	SUBTOTAL	31900	0.17%	38755	0.14%	54825	0.10%

4..EXTERNAL FAILURE COST	A. COMPLAINTS CLIENT'S	4800		4720		7300	
	B. SALES RETURNS AND SALES DISCOUNTS	318000		4400		5550	
	C. CUSTOMER SERVICE COSTS SUPPLEMENT	2600		2140		2900	
	SUBTOTAL	25400	0.14%	11260	0.04%	15750	0.03%
5. THE TOTAL COSTS OF QUALITY		328690		468775		840365	
6 SALES		18500000		27900000		56683000	
7. THE PRO-PORTION OF TOTAL COSTS OF THE QUALITY OF TOTAL SALES		1.78%		1.68%		1.48%	

4.3 Conclusion on the analysis of quality costs

As a way of evaluating the effectiveness of the company quality system, quality cost analysis can uncover problems, develop measures and improve the general system of organization.

Application of base paper maps Pareto and cause-effect analysis suggests three directions for practical quality control cost of action:

1. Cost of quality control satisfactory performance depends not only on efforts to calculate the specialists but also for support and management and even the President.
2. Quality cost control support marketing decisions of companies in introducing quality improvement products and earning a higher return. Through effective cost cutting internal and external failures in the implementation of TQM quality control costs, companies can invest more in prevention and appraisal costs and entry into further analysis of the main problems of determinants
3. Control costs and raise quality confirms the company's position, leading to increased revenue for investment. Decreased costs of external failures demonstrate that products meet customer demand and as companies gain competitive advantage while increasing market share. Although investments in prevention and appraisal may be higher than the reduction of internal defects and external costs, such investments contribute to increasing sales

and declining sales total cost of quality. Therefore, cost management and quality control plays an important role in company strategy.

5 Conclusions

The focus on cost, quality and period of time, has generated more change management with important implications in Managerial Accounting. These changes include increasing the strategic management initiatives, such as activity-based costing (ABC) and Total Quality Management (TQM).

The literature contains many references to the ability of ABC method to help correct this lack of information. McConville (1993) show that the ABC method complements TQM providing quantitative data on improvements made as part of TQM.

Steimer (1990) argue that ABC is a perfect sequence for TQM, it encourages management to analyze activities and determine the amount of work. Anderson and Sedatole (1998) argue that many companies are finding that the ABC scheme fits well with the quality and cost to extend the link between ABC and TQM in the design process. Evidence the benefit of ABC and TQM was found in the case studies conducted by Cooper (1992), who found high compatibilities and mutual support between ABC and TQM.

Researchers have argued strongly that the ABC method can provide better visibility into business processes and deliver a vision cost drivers, and managers could therefore eliminate costs in relation to activities that do not value and processes to improve its efficiency existing (Carolfi, 1996).

Improve information visibility enables development of quality initiatives by identifying activities that are associated with low quality of products and associated cost drivers (Ittner, 1999, Cooper, Kaplan, Maisel, Morrissey, & Oehm, 1992).

ABC method can be associated with adoption of improved business processes, activities included in TQM programs (Ittner & Larcker, 1997, Anderson et al., 2002). Moreover Datar and Gupta (1994) talk about increasing costs and improve quality through increased cost specification errors in measuring the frequency of product costs. Banker and Potter (1993) and Christensen and Demski (1997) ABC method mentioned ability to produce accurate cost estimates, and other costs that depend on factors such as market competitiveness and quality of information technology infrastructure of the organization.

First, ABC allows managers to accurately track costs and determine the identification of excessive resources and thus support the implementation of TQM and other quality improvement programs processes.

Managers can use information gathered by ABC analysis, Pareto analysis leading to the cost drivers' analysis of key cost, an important ingredient in most TQM initiatives. Model is a test in addition to the successful implementation of TQM.

Lessons learned from successful implementation of TQM using ABC, is a proof for the solution adopted.

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